

# MAGNETIC TRAIN IN VACUUM CAN MOVE AT SPEED OF SOUND

The hyperloop train in its current version was conceptualized by billionaire inventor Elon Musk, who publicized it in 2012, open-sourced it and encouraged others to take the ideas and develop them. Hyperloop One, now called Virgin Hyperloop One, which has entered into an agreement with Maharashtra, is a private company founded in 2014 with the aim of placing hyperloop trains around the world by 2021



In December 2017, Hyperloop One's pod reached a top speed of over 385 kmph on its test track in the Nevada desert, north of Las Vegas. The targeted speed is 1,223 kmph

## THE POD

Hyperloop One's first-generation pod combines a carbon fiber shell around a custom-built levitating chassis

**Aeroshell** Made of carbon fibre panels. The material is much lighter and stronger than steel



**Levitating chassis** Is made of aluminium and houses the propulsion system and magnets for levitation and guidance. Its design is similar to a Formula 1 car. It is built like a shell to be lightweight but strong

## Dimensions

Length | **8.7 m**  
(28.5 ft)

Width | **2.7 m**  
(8.9 ft)

Height | **2.4 m**  
(7.9 ft)

## SCALE

Hyperloop tube



Metro tunnel



**Pod** | A pod or several pods will carry passengers through the tube with most of the air removed to reduce friction

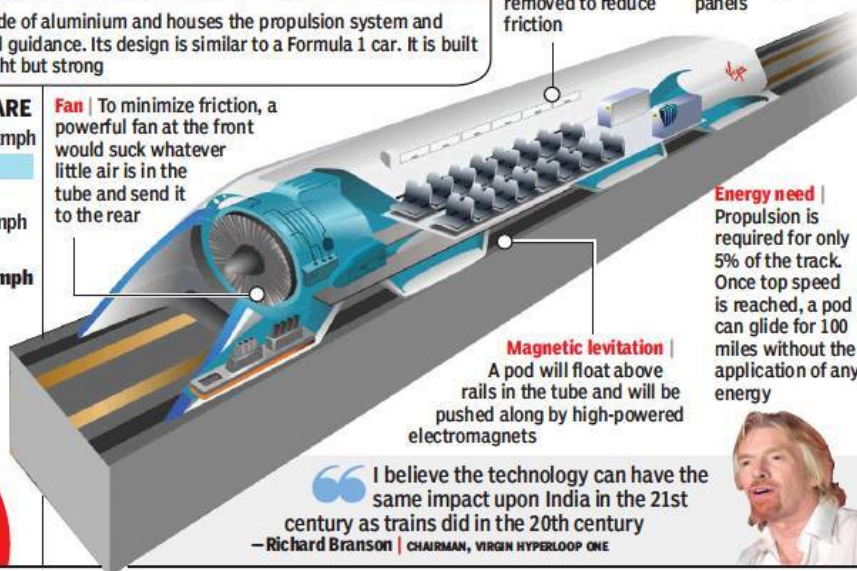
**Tube** | A partial vacuum tube will be supported above ground and supplied with energy by solar panels

## HOW SPEEDS COMPARE

Concorde*	2,180 kmph
Speed of sound	1,235 kmph
Hyperloop	1,223 kmph
Aircraft	780 kmph
Bullet train	450 kmph

\*No longer in service

**Fan** | To minimize friction, a powerful fan at the front would suck whatever little air is in the tube and send it to the rear



**Energy need** | Propulsion is required for only 5% of the track. Once top speed is reached, a pod can glide for 100 miles without the application of any energy

**Magnetic levitation** | A pod will float above rails in the tube and will be pushed along by high-powered electromagnets

## JOURNEY TIME

Mumbai to Pune |

**20 minutes**

**"I believe the technology can have the same impact upon India in the 21st century as trains did in the 20th century"**

— Richard Branson | CHAIRMAN, VIRGIN HYPERLOOP ONE



The estimated cost of the route is around Rs 20,000 crore, which officials say works out cheaper than other forms of high-speed on-ground travel.

"Individual parts of the loop will go inside individual gates of the (proposed) airport, reducing travel time further. The project will leapfrog Maharashtra into a transport hub," said Branson. He said the system will have a capacity of 150 million passengers per year (saving more than 90 million hours of travel time), with a potential to reduce greenhouse gases by 150,000 tons a year. Hyperloop is a technology in which a passenger-carrying capsule moves almost at the speed of sound using magnetic levitation through an almost air-less tube. The technology is not yet commercially operational anywhere in the world. "Possibly, India may have this track as the first operationalized route, though Dubai is competing close," Branson said. "The Pune-Mumbai route is an ideal first corridor as part of a national hyperloop network."

VHO CEO Rob Lloyd said, "We have always believed that India would be a tremendous market for the hyperloop. The Pune-Mumbai route is one of the strongest economic cases we have seen to date."

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Officials said that under the agreement, the company will also look at potential routes and undertake preliminary studies to analyze the economic impact and technical viability of hyperloop transportation in India. The US-based company signed the Maharashtra agreement in the presence of Prime Minister